

WHAT IS CLAIMED IS:

1. An optically pumped semiconductor laser component, comprising:
a multilayer structure including a mirror structure surmounted by a multilayer
5 gain-structure; and
at least a first heat conducting element having a high thermal conductivity and
having first and second opposite surfaces, said heat-conducting element being contact-
bonded via said first surface thereof to one of said mirror structure and said gain-
structure.
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2. The component of claim 1, wherein the thermal conductivity of said first heat
conducting element is greater than the thermal conductivity of copper.
3. The component of claim 1, wherein said first heat conducting element is
15 contact bonded to said mirror structure.
4. The component of claim 3 wherein said mirror structure is a multilayer
semiconductor structure.
- 20 5. The component of claim 3 wherein said mirror structure is a multilayer
dielectric structure.
6. The component of claim 3, wherein said mirror structure includes a metal
layer and one or more dielectric layers.
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7. The component of claim 3, further including a second heat-conducting
element having first and second opposite surfaces, said first surface of said second heat
conducting element being contact bonded to said gain-structure.

8. The component of claim 7, wherein said gain-structure emits light at a laser wavelength in response to being optically pumped by light having a pump wavelength, and said second heat conducting element is transparent to said pump wavelength and
5 said laser wavelength.

9. The component of claim 8, wherein said second heat conducting element is one of a diamond element and a sapphire element.

10 10. The component of claim 1, wherein said first heat-conducting element is a diamond element.

11. The component of claim 10, wherein said second surface of said first heat-conducting element is in thermal contact with a heat sink.

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12. The component of claim 11, wherein said heat sink is a copper heat sink.

13. The component of claim 1, wherein said first surface of said first heat conducting element is contact bonded to said gain-structure.

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14. The component of claim 13, wherein said gain-structure emits light at a laser wavelength in response to being optically pumped by light having a pump wavelength, and said second heat conducting element is transparent to said pump wavelength and said laser wavelength.

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15. The component of claim 15, wherein said second heat conducting element is one of a diamond element and a sapphire element.

16. An optically pumped semiconductor laser component, comprising:
a multilayer structure including a mirror structure surmounted by a multilayer gain-structure; and

5 at a diamond heat spreader element having first and second opposite surfaces,
said heat spreader element being contact-bonded via said first surface thereof to one of
said mirror structure and said gain-structure.

17. The component of claim 16, wherein said heat spreader element is contact
bonded to said mirror structure.

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18. The component of claim 16 wherein said diamond heat spreader element is
formed from one of crystal diamond or CVD diamond.

19. A method of mounting an OPS-structure on a heat sink, comprising the
15 steps of:

providing a heat spreader element having first and second opposite surfaces and
having thermal conductivity higher than the thermal conductivity of the heat sink;
contact bonding the OPS-structure to said first surface of said heat spreader
element; and

20 bonding said second surface of said heat spreader element to the heat sink.

20. The method of claim 19, wherein said second surface of said heat spreader
element is bonded to the heat sink by solder bonding.

21. A method of mounting an OPS-structure on a heat spreader element,
25 comprising the steps of:

growing a multilayer semiconductor gain-structure on a substrate;
growing a mirror structure on said gain-structure;

contact bonding a surface of the heat spreader element to said mirror structure;
and
etching away said substrate to expose said gain-structure.